

We claim

1. A peptide for inducing in a cell a resistance to an anti-microtubule agent comprising:

5 (a) a sequence shown in any one of SEQ ID NO.s: 5 to 10; or

(b) a sequence that has at least 80% identity to the sequence shown in SEQ ID NO: 5 and wherein residue number 187 is histidine; or

10 (c) a sequence that has at least 80% identity to the sequence shown in SEQ ID NO: 6 and wherein residue number 103 is leucine; or

(d) a sequence that has at least 80% identity to the sequence shown in SEQ ID NO: 7 and wherein residue number 98 is leucine; or

15 (e) a sequence that has at least 80% identity to the sequence shown in SEQ ID NO: 8 and wherein residue number 162 is methionine; or

(f) a fragment of a peptide according to any one of (a) to (e).

20 2. A nucleic acid molecule that encodes a peptide according to claim 1.

3. A nucleic acid molecule for inducing in a cell a resistance to an anti-microtubule agent comprising:

25 (a) a sequence shown in any one of SEQ ID NO.s: 1 to 4; or

(b) a sequence that has at least 80 % identity to the sequence shown in SEQ ID NO: 1 and wherein nucleotide number 559 is cytosine; or

30 (c) a sequence that has at least 80 % identity to the sequence shown in SEQ ID NO: 2 and wherein nucleotide number 307 is thymine; or

(d) a sequence that has at least 80 % identity to the sequence shown in SEQ ID NO: 3 and wherein nucleotide number 293 is thymine; or

35 (e) a sequence that has at least 80 % identity to the sequence shown in SEQ ID NO: 4 and wherein nucleotide number 485 is thymine; or

(f) . a fragment of a molecule according to any one of (a) to (e).

4. A vector comprising a nucleic acid molecule according to claim 3.

5 5. A cell comprising:

(a) a peptide according to claim 1; or

(b) a nucleic acid molecule according to claim 3;

or

(c) a vector according to claim 4.

10 5. A method for inducing in a cell a resistance to an anti-microtubule agent comprising the step of providing in a cell, a nucleic acid molecule that encodes a mutant  $\gamma$  actin, or providing in a cell, a mutant  $\gamma$  actin.

15 6. A method for producing a cell that is resistant to an anti-microtubule agent comprising the step of providing in a cell, a nucleic acid molecule that encodes a mutant  $\gamma$  actin, or providing in a cell, a mutant  $\gamma$  actin.

20 7. A method for treating an individual for cancer with an anti-microtubule agent comprising the step of providing in a non cancerous cell of the individual, a nucleic acid molecule that encodes a mutant  $\gamma$  actin, or providing in a non cancerous cell, a mutant  $\gamma$  actin, to induce in the non cancerous cell, a resistance to an anti-microtubule agent.

25 8. A method for determining whether a compound is capable of treating a cell having a drug resistance phenotype comprising the steps of:

30 providing in a cell a nucleic acid molecule that encodes a mutant  $\gamma$  actin, or providing in a cell, a mutant  $\gamma$  actin, to induce in the cell, a resistance to an anti-microtubule agent; and

contacting the cell with the compound to determine whether the compound is capable of treating the cell.